

# Asbestos

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**Asbestos** (pronounced /æsˈbɛstəs/ or /æzˈbɛstəs/) is a set of six naturally occurring silicate minerals<sup>[1]</sup> which all have in common their eponymous asbestiform habit: long (roughly 1:20 aspect ratio), thin fibrous crystals, with each visible fiber composed of millions of microscopic "fibrils" that can be released by abrasion and other processes.<sup>[2]</sup> They are commonly known by their colors, as "blue asbestos", "brown asbestos", "white asbestos", and so on.

Asbestos mining began more than 4,000 years ago, but did not start large-scale until the end of the 19th century when manufacturers and builders used asbestos because of its desirable physical properties:<sup>[1]</sup> sound absorption, average tensile strength, its resistance to fire, heat, electrical and chemical damage, and affordability. It was used in such applications as electrical insulation for hotplate wiring and in building insulation. When asbestos is used for its resistance to fire or heat, the fibers are often mixed with cement or woven into fabric or mats. These desirable properties made asbestos a very widely used material, and its use continued to grow throughout most of the 20th century until the carcinogenic effects of asbestos dust caused its effective demise as a mainstream construction and fireproofing material in most countries. However around 2 million tons of Asbestos are still mined per year as of 2009, mainly in Russia (50%), China, Brazil, Kazakhstan and Canada (9% to 14% each).

It is now known that prolonged inhalation of asbestos fibers can cause serious and fatal illnesses including malignant lung cancer, mesothelioma, and asbestosis (a type of pneumoconiosis).<sup>[3][4]</sup> Health issues related to asbestos exposure can be found in records dating back to Roman times. By the beginning of the 20th century concerns were beginning to be raised, which escalated in severity during the 1920s and 1930s. By the 1980s and 1990s asbestos trade and use started to become banned outright, phased out, or heavily restricted in an increasing number of countries.

The severity of asbestos-related diseases, the material's extremely widespread use in many areas of life, its continuing long term use after harmful health effects were known or suspected, and fact that asbestos-related diseases can emerge decades after exposure ceases, have resulted in asbestos litigation becoming the longest, most expensive mass tort in U.S. history and a significant legal issue in many other countries. Asbestos-related liability also remains an ongoing concern for many manufacturers, insurers and reinsurers.

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Asbestos



Fibrous tremolite asbestos on muscovite

### General

<b>Category</b>	Mineral
<b>Formula</b> (repeating unit)	<span>Mg<sub>3</sub>Si<sub>2</sub>O<sub>5</sub>(OH)<sub>4</sub></span> Chrysotile is one of the six minerals that are regulated as "asbestos". The five others are tremolite, anthophyllite, amosite (grunerite), crocidolite (riebeckite), and actinolite.
<b>Strunz classification</b>	09.ED.15
<b>Dana classification</b>	71.01.02d.03

### Identification

<b>Formula mass</b>	277.11 gm
<b>Color</b>	white
<b>Crystal habit</b>	Amorphous, Granular, Massive
<b>Crystal system</b>	Orthorhombic
<b>Fracture</b>	Fibrous
<b>Mohs scale hardness</b>	2.5 - 3
<b>Luster</b>	Silky
<b>Streak</b>	White
<b>Optical properties</b>	Biaxial
<b>Birefringence</b>	0.008
<b>2V angle</b>	20° to 60°
<b>Dispersion</b>	relatively weak
	Non-fluorescent